# Barnes County Sheyenne Watershed Project


## Barnes County Soil Conservation District
575 10th St SW
Valley City, ND 58072

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**STATE:** North Dakota **WATERSHED:** James, Sheyenne, Maple
**HYDROLOGIC UNIT NUMBER:** 10160003, 09020203, 09020204, 09020205
**HIGH PRIORITY WATERSHED:** Yes

| PROJECT TYPES | WATERBODY TYPES | NPS CATEGORY |
|---|---|---|
| __ STAFFING & SUPPORT | __ GROUNDWATER | X_ AGRICULTURE |
| X_WATERSHED | X_ LAKES/RESERVOIRS | __ URBAN UNOFF |
| __ I & E | X_ RIVERS | |
| | X_ STREAMS | |
| | __ WETLANDS | |

**PROJECT LOCATION:** Barnes County, North Dakota

**SUMMARIZATION OF MAJOR GOALS:** The Barnes County Sheyenne Watershed Project is designed to provide technical, financial and educational assistance to all agriculture producers and landowners with riparian acreage within the county. Our goal is to restore and maintain the recreational and aquatic uses of the Sheyenne River and its tributaries in Barnes County, and to protect the water quality of the Maple and James Rivers and their tributaries.

**PROJECT DESCRIPTION:** Project sponsors intend to 1) provide technical and financial assistance to producers and landowners within ½ mile of the Sheyenne River and its tributaries and to prioritize locations outside this corridor 2) assist with best management practices that protect/enhance our riparian areas 3) develop educational programs to heighten public awareness of non-point source pollution impacts and solutions 4) develop working partnerships in the local community to benefit natural resources

| | | | |
|---|---|---|---|
| 319 Funds Requested: | $848,700.00 | State/Local Match: | $565,800.00 |
| Other Federal Funds: | $45,000.00 | Total Project Cost: | $1,459,500.00 |

## 2.0 STATEMENT OF NEED

2.1 As the Sheyenne River is a major drinking water resource and recreational environment for numerous communities, we feel the Barnes County Sheyenne Watershed Program is crucial in protecting our most valued natural resource. We feel it is vital to provide the essential education and resources to assist our local residents with the tools to accomplish these significant goals.

The overwhelming cold temperatures and record snowfall of our 2009 winter, followed by the devastating flooding of the Sheyenne River has initiated a considerable amount of concern. Producers are taking a much closer look at their operations, and are turning to us for assistance. What could they do to protect their livestock as well as the river? Do they relocate? What are their options?

Data from the 2008 List of Section 303(d) for TMDL waters shows that Lake Ashtabula, and Bald Hill Creek are not supporting and fully supporting but threatened, respectively for recreation. Traveling downstream we find that fish and aquatic biota are fully supported, but threatened the entire reach south to the county line. Natural and man-made stressors that were most influential in the total ranking include; urban areas, farmed wetlands, cropland, road density, animal unit density, and pasture/rangeland needing improvement. Primary pollutants identified in the 305(b) Report that may be causing the aquatic life use impairments include suspended solids, fecal coliform bacteria, nutrients, and organic material. Pathogens, as indicated by fecal coliform bacteria, are the primary causes of recreation use impairment. Sources of the elevated fecal coliform bacteria concentrations included livestock feeding areas, riparian grazing, and urban runoff. To some extent, municipal sewer bypasses also contribute to the fecal coliform bacteria contamination.

Findings similar to the 303(d) report were obtained during the 1995-1996 assessment performed by the Barnes County SCD. The Final Monitoring Project Report is on file with the North Dakota Health Department.

It is also imperative that we provide equal opportunities to all producers and landowners within the county. All water resources are vital to our existence and we must value their individual motivations in addressing their water quality concerns. Priority will be given to those projects within ½ mile of the Sheyenne, James and Maple Rivers as well as their tributaries. The NDSU Assessment Tool for New or Existing Animal Feeding Operations will also be utilized in prioritizing technical as well as financial assistance. We would like to address those projects having the greatest impact first.

2.2 Barnes County is in the southeastern part of North Dakota. It has a total area of 956,800 acres. Of this acreage 13,790 acres is water. The Sheyenne River is entrenched in a valley about 2 miles wide and 150 feet deep, which flows south through the center of Barnes County before it eventually drains into the Red River of the North. Baldhill Dam, constructed across the Sheyenne River in 1950, is about 12 miles north of Valley City. The impounded body of water (5,430 acres) is Lake Ashtabula.

The Maple River flows through the eastern edge of the county and, along with its tributaries drains the eastern one-fourth of Barnes County. The Continental Divide crosses the western part of Barnes County. Areas here drain into the James River and eventually empty into the Gulf of Mexico.

2.3 See attached Maps (Appendix #1)

2.4 The Sheyenne River Watershed originates in central North Dakota and flows southeasterly about 250 miles to join the Red River of the North. Barnes County is in the Drift Prairie section of the Central Lowland province of the Interior Plains. The Drift Plains ecoregion is characterized by generally flat to occasionally rolling topography with a thick layer of glacial till left behind by the Wisconsinan glaciers. The Drift Plain grasslands, prior to cultivation, were a mixture of tall grass and short grass prairie. Seasonal and temporary wetlands are common within this ecoregion. Bedrock is exposed in the valleys of the Sheyenne River and the Bald Hill Creek. The flood plains of these and other streams are blanketed by alluvium. Elevation ranges from about 1,080 feet on the flood plain of the Sheyenne River south of Kathryn to about 1,570 feet on the crest of an end moraine north of Valley City.

Barnes County is usually quite warm in the summer and very cold in the winter, when arctic air masses frequently surge over the area. Total annual precipitation is about 18 inches. Of this, about 14 inches, or more than 75%, usually falls in April through September. The growing season also falls within this same period. Average seasonal snowfall is about 31 inches.

The natural resource management concerns are erosion control, primarily wind and water erosion on cropland, and animal unit densities. Of the 956,800 acres within the county, 82% is cropland, 13% grass and the remaining 5% urban/water. Corn, soybeans, and wheat are the principal crops grown, with row crops being the majority of acres planted. Cow/calf production with feeder or butcher animals provides the majority of the livestock industry. Of potentially 180 livestock producers, approximately 63 (35%) are within ½ mile of the Sheyenne River and its tributaries. Further investigative work will be done, if the project is approved for the James and Maple Rivers and their tributaries. Priority will be given to BMP's within ½ miles of the 3 mentioned rivers and their tributaries. The majority of these livestock feeding operations would fall into the medium or small AFO category.

See attached maps located in Appendix #1.

2.5 River water quality monitoring was established on the Sheyenne in 1995 with five sites and then a total of nine sites in 1996. Samples collected at these sites were used to 1) establish a baseline set of water quality data and: 2) determine if there are any spacial trends in water quality over the course of the project area. Sampling was implemented again in 2002 at 8 sites and continued until 2006. From 2006 through today, 4 of those 9 sites continue to be sampled. The goals at this time are to measure and document the effectiveness of installed BMPs at improving the water quality and restoring the beneficial uses (aquatic life and recreational) within the Barnes County Sheyenne River watershed. Samples collected are analyzed for total nitrogen, total Kjeldahl nitrogen, nitrate-nitrite, total phosphorus, total suspended solids, and fecal coliform bacteria. Samples are taken twice per week in April and May, once per week in June and once per month from July to November.

Primary pollutants which may be causing the aquatic life use impairments include suspended solids, nutrients, and organic material. Pathogens, as indicated by fecal coliform bacteria, are the primary causes of recreation use impairment. The following water quality summaries are based on data collected from 1995 to 2008.

Median nitrate-nitrite concentrations have a yearly tendency to decrease from March through September. Levels at all sites were approximately two-four times the NDDH recommended

level of 0.25 mg/l for at least 2 years in the project lifespan. When inter-year median concentrations are examined, all sites show related shifts in levels (higher or lower) which suggests something other than surface run-off or internal cycling is controlling nitrate-nitrite concentrations.

We are witnessing the same basic pattern of higher levels of total Kjeldahl nitrogen occurring in early spring and subsequently dropping off. Consistently higher levels of Kjeldahl nitrogen have been found at the Valley City north site.

For the most part median concentrations were higher the farther downstream the sample was taken. The NDDH's state guidelines of 0.1 mg/l phosphorus in riverine systems was exceeded at all sites in 2002-2008. All sites had yearly median concentrations and were two to three times the state guidelines throughout 2002-2008.

There is an increasing trend of total suspended solids (TSS) levels the further downstream the sample was taken. TSS values rise sharply with the spring melt and then drop by May 1 and remain stable throughout the summer.

A majority of the fecal coliform results show relatively low geometric mean levels which reveal that the watershed does not have chronically high fecal coliform concentrations. However, samples collected after rainfall events show an acute problem with surface runoff as 6 of 8 sites had at least one year where 10% of samples taken at the site exceeded the state standard of 400 CFU per 100 ml collected.

Most of the nutrient loading/concentrations closely correspond to the hydrograph. The only deviations were from "peak" concentrations following major rain events.

The project plans to reduce the nutrient input and reduce the erosion and sedimentation rates by addressing cropland issues, range and grazing concerns, and riparian degradation. Priority will be given to those projects within ½ mile of the Sheyenne, James and Maple Rivers as well as their tributaries. The NDSU Assessment Tool for New or Existing Animal Feeding Operations will also be utilized in prioritizing technical as well as financial assistance.

See attached maps (Appendix #1) and graphs (Appendix #2)

## PROJECT DESCRIPTION

**GOAL 1:**

Restore and maintain the recreational uses and to achieve and/or maintain a "fully supporting" status for aquatic life uses of the Sheyenne River and its tributaries in Barnes County. As a secondary goal the project will also protect the water quality of the Maple and James Rivers and their tributaries located in Barnes County

**Objective 1)** Reduce fecal coliform concentrations on the Sheyenne River and its tributaries to achieve fully supporting status for recreational and aquatic life uses. Target concentration per sampling site will be a geometric mean of 200 colonies/100 ml with less that 10% of the samples exceeding 400 colonies/100 ml.

Task 1: Design and install full containment manure management systems for 4 of the highest priority livestock feeding areas in the Sheyenne River watershed in the county. (5 years)

Product: 4 manure management systems. Refer to the attached BMP budget (Appendix #5) for the types and amount of BMPs.

Cost - $480,000

Task 2: Develop manure management plans and install the appropriate structural practices to complete partial containment systems for 8 small AFOs within ½ mile of the Sheyenne River and/or its tributaries. (5 years)

Product: 8 partial systems. Refer to the attached BMP budget (Appendix #5) for the types and amount of BMPs.

Cost - $40,000

Task 3: Work with livestock producers to develop prescribed grazing systems and/or install vegetative buffers, channel stabilization or streambank protection structures that will protect and/or restore the stability of 10 miles of streambank along the Sheyenne River and it's tributaries. (5 years)

Product: 10 miles of restored or protected streambank. Refer to the attached BMP budget (Appendix #5) for the types and amount of BMPs.

Cost – $180,000

Task 4: Evaluate the potential pollutant concerns associated with failed or improperly installed septic systems along the river. Priority will be given to those 10 systems having the greatest impact.

Product: An inventory of the number and location of septic systems needing upgrades or replacement. (1 year)

Cost – Included in staffing costs

Task 5: Upgrade or replace 10 failed or non-functioning septic systems that have the potential to directly discharge into the river. (5 years)

Product: 10 septic systems

Cost - $80,000

**Objective 2)** Protect the water quality of the Maple and James Rivers and their tributaries in Barnes County and minimize the potential delivery of pollutants that may impact downstream beneficial uses. The following tasks that fall in the Maple River watershed will be coordinated with the Maple River project. See Coordination Plan Section #11.

Task 6: Improve livestock manure management in feeding areas located within ½ mile of the Maple and James Rivers and their tributaries in Barnes County. (5 years)

Product: 2 full containment systems and 4 partial manure management systems. Refer to the attached BMP budget (Appendix #5) for the types and amount of BMPs.

Cost – $260,000

Task 7: Develop prescribed grazing systems and establish sufficient riparian buffers to protect/restore the stability of 5 miles of streambanks along the James & Maple Rivers and their tributaries. (5 years)

Product: 5 miles of protected streambank. Refer to the attached BMP budget (Appendix #5) for the types and amount of BMPs.

Cost - $100,000

**Objective 3)** Carry out an Information/Education Program within the entire county to increase community awareness of the impacts of non-point source pollution and means of protecting and maintaining our natural resources.

Task 8: To conduct information and education programs to increase awareness of North Dakota State Health Department and EPA livestock rules and regulation, the benefits of nutrient management, proper grazing and pasture management techniques, suitable riparian management, and heightened public awareness of septic system management, installation and county regulations. (5 years)

Product: Annual tours, school programs and workshops, quarterly newsletters, newspaper articles and radio programs when appropriate, web site, annual ND Winter Show displays, one-on-one contacts and annual public meetings

Cost - $10,500

Task 9: The SCD will continue to coordinate with NDSU Extension and USGS on the educational events associated with the Discovery Farm. Water quality data obtained through this demonstration project may be utilized in future manure management decisions. (5 years)

Product: Tours, water quality data, news articles.

Cost - $500 (Sampling expenses included in sample transport)

3.3 Milestone Table (Appendix #4)

3.4 Not applicable

3.5 The Barnes County Soil Conservation District is the appropriate entity to coordinate and implement this project. The SCD is a locally elected volunteer conservation organization that serves all the

people in the county. The sponsors will work with the North Dakota Department of Health and NRCS to determine the need for any environmental permits for livestock waste management systems. Project staff will consult with NDDH and project engineers to determine applicability of current livestock waste regulations.

3.6 The Barnes County Soil Conservation District will be responsible for auditing Operation & Maintenance Agreements (O&M) on BMP's during the project period through yearly status reviews of EPA-319 contracts. The lifespan of each BMP will be listed in the individual contracts to ensure longevity of the practices. Each producer will sign the "EPA 319 Funding Agreement Provisions" form which explains in detail the consequences of destroying a BMP before the completion of its lifespan.

## 3.0 COORDINATION PLAN

3.1 1) Barnes County SCD will be the lead agency liable for project administration. Conservation planning, technical assistance, educational campaigns, clerical assistance, access to equipment and supplies, and annual financial support will be provided by the SCD. The SCD will also prioritize activities, coordinate scheduling, and serve as a liaison between watershed residents and USDA program participation.

2) USDA Natural Resources Conservation Service (NRCS) will provide technical assistance by coordinating project activities, facilitating local involvement, providing technical support and participating in educational outreach programs during the project. Staff will incorporate existing USDA programs (financial and technical) and target resources to enhance efforts within the watershed. Existing office space and office equipment use will be made available to the project. An annual review will be conducted with the Field Office, DC and the SCD to reconfirm and acknowledge NRCS's commitment to the project.

3) North Dakota State Health Department (NDDH) will oversee Section 319 funding and assist in implementing the water sampling and analysis plan. Training will be provided by the NDDH staff for proper water quality sample collection, preservation and transportation to ensure reliable data collection. NDDH will also complete and cover the expenses of water sample analysis.

4) USDA Farm Service Agency (FSA) will provide cost-share assistance through the Conservation Reserve Program (CRP) and will serve as a local resource.

5) North Dakota State University Extension Service (NDSU Extension) both local and state personnel will assist the project in information and education activities. BMP publications will also be available as well as assistance with workshops, tours and training.

6) North Dakota Game & Fish (ND G&F), North Dakota Pheasants Forever and US Fish & Wildlife will provide technical and financial assistance.

7) Barnes County Rural Water Users (RWU) will provide financial assistance to producers and landowners in sealing abandoned wells.

8) 319-Eco-Ed camps will provide youth education of water quality pollution impacts and potential solutions for local 6$^{th}$ grade students.

9) We will continue to be active with the State Envirothon program, which is a competitive problem-solving natural resource event for high school students to provide education on our natural resources and the environment.

10) NPS BMP Team will provide engineering assistance through the Sheyenne James RC&D Council. Engineers will provide assistance for Agricultural Waste Systems, Water Management, Stream Bank Restorations, Environmental Assessments and Impacts, as well as Wetland Delineations and Assessments.

11) Projects and programs on the Maple River Watershed within Barnes County will be assisted by the Barnes County Watershed Coordinator. Projects on the Maple River outside of Barnes County will be assisted by the Maple River 319-Watershed Project, sponsored by the Cass County Soil Conservation District. Lines of communication will be kept open between both coordinators.

12) We will continue to cooperate with USGS, and NDSU Extension Service at the Discovery Farm near Dazey, to collect and evaluate baseline data; identify feasible BMP's; and evaluate BMP effectiveness.

3.2 Local support for this county-wide project has been confirmed by the inquiries received after a livestock producer letter was sent out in January of 2009. The overwhelming destruction and devastation of the 2009 flood has also created a heighten concern, and rethinking of current management methods. Response to articles in our quarterly newsletter is also showing a steady increase, and a considerable amount of interest is always expressed during the six days at the annual Winter Show booth. All of this, along with the increased office traffic and phone calls verifies the interest and support of landowners and producers.

3.3 Letters of Support are attached. (See Appendix #3)

3.4 The Barnes County SCD has a solid understanding of the USDA programs, such as EQIP, CRP, WRP and WHIP and works closely with FSA, NRCS and the RC&D. With the previous 319 projects, working relations with sponsors have already been established and will continue to expand and develop.

3.5 By working closely with sponsors and associated agencies the lines of communication are always open; exchanging ideas, planning, and brain-storming to meet the needs of our rural and urban county residents. By remaining in close contact with all organizations in the area, we will be enhancing and complementing other projects.

## 4.0 EVALUATION AND MONITORING PLAN

"The Quality Assurance Project Plan (QAPP) for the project will be developed by the NDDH after the project is fully approved"

## 5.0 BUDGET

5.1 See Attachments (Appendix #5)

## 7.0 PUBLIC INVOLVEMENT

7.1 Educational and informational meetings have been and will continue to be conducted to keep the entire community informed. Community leaders, County Commissioners, Water Resource Board members, City Council members, and District supervisors will be involved in decision-making processes involving the implementation of BMP's within the Barnes County Sheyenne River Watershed Program.

# THE BARNES COUNTY SHEYENNE WATERSHED PROJECT APPENDIX LIST

1 Barnes County Maps

2 Summary of Sampling Results

3 Letters of Support

4 Milestone Table

5 Budget Tables

# Appendix #1

# BARNES COUNTY MAPS

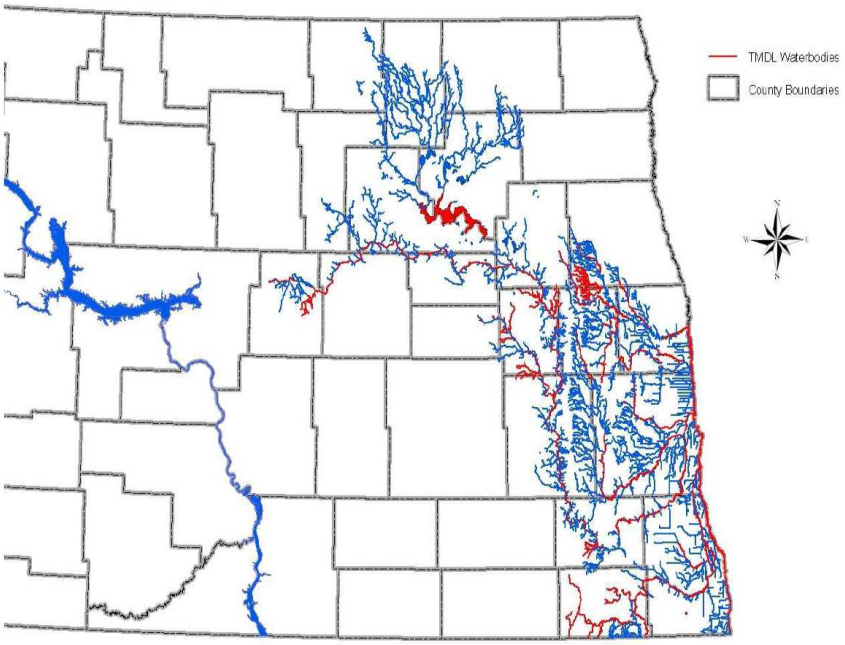
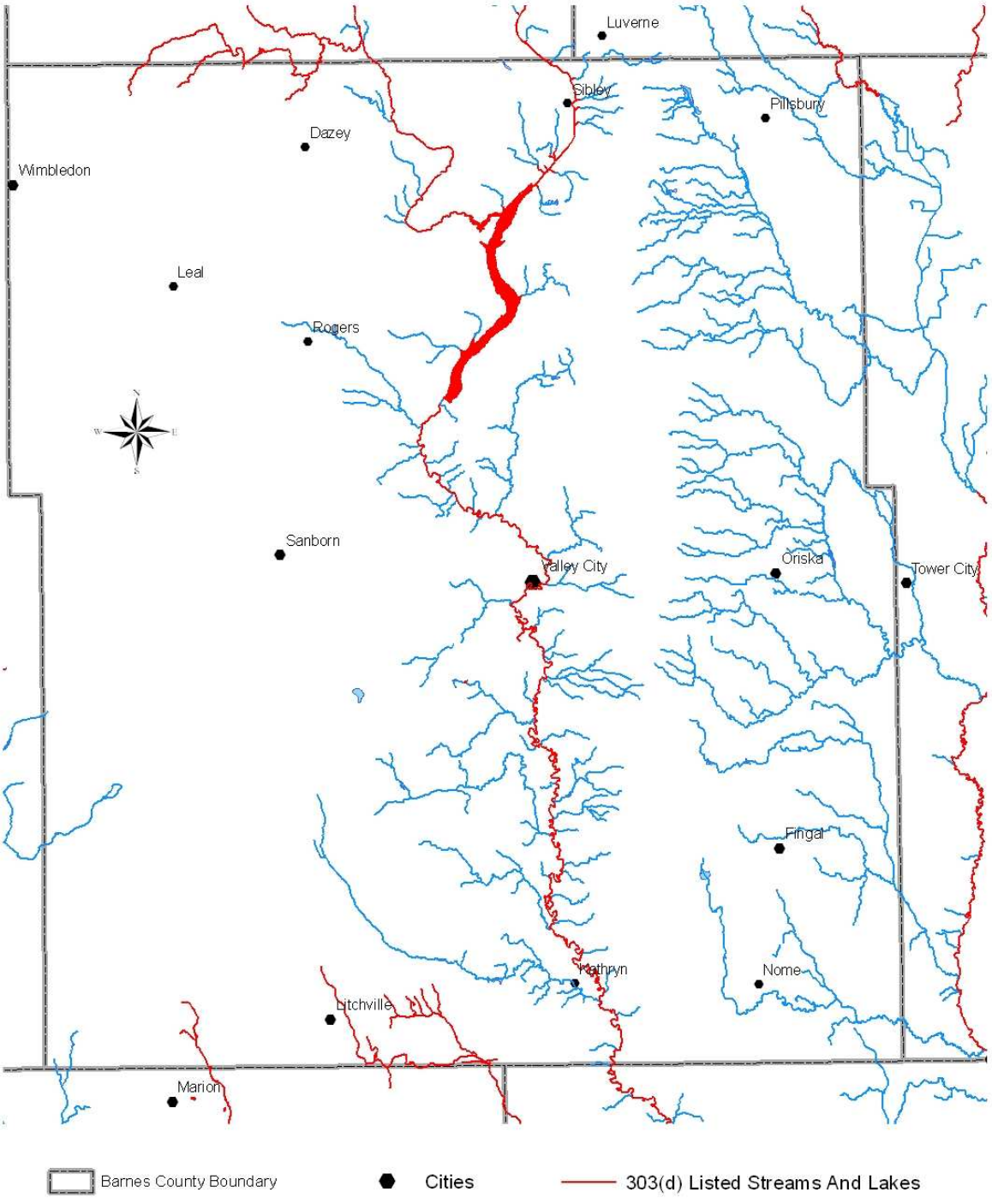



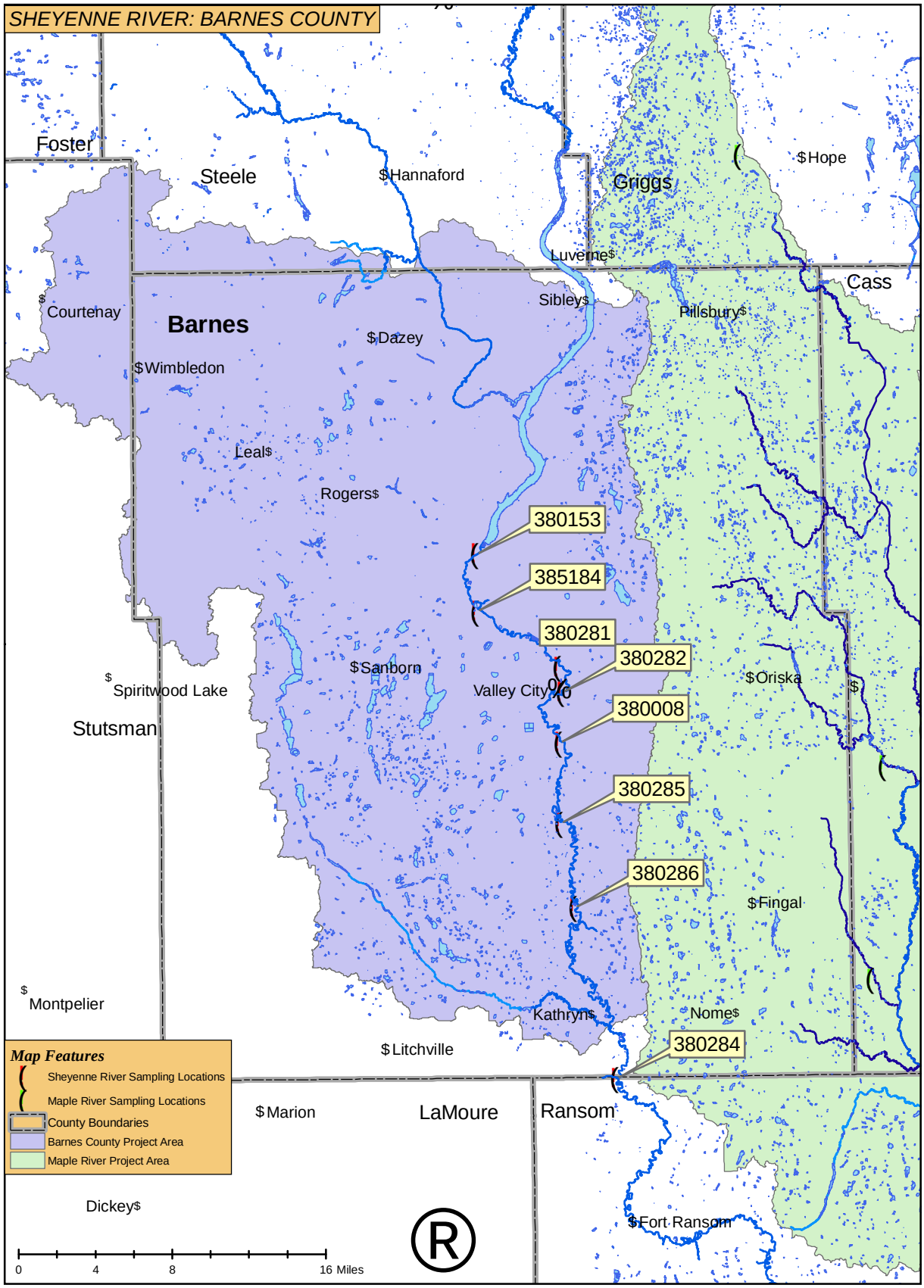

**Figure VI-2. Graphical Depiction of 2008 Section 303(d) Listed Waters Needing TMDLs in the Upper Red River Basin**



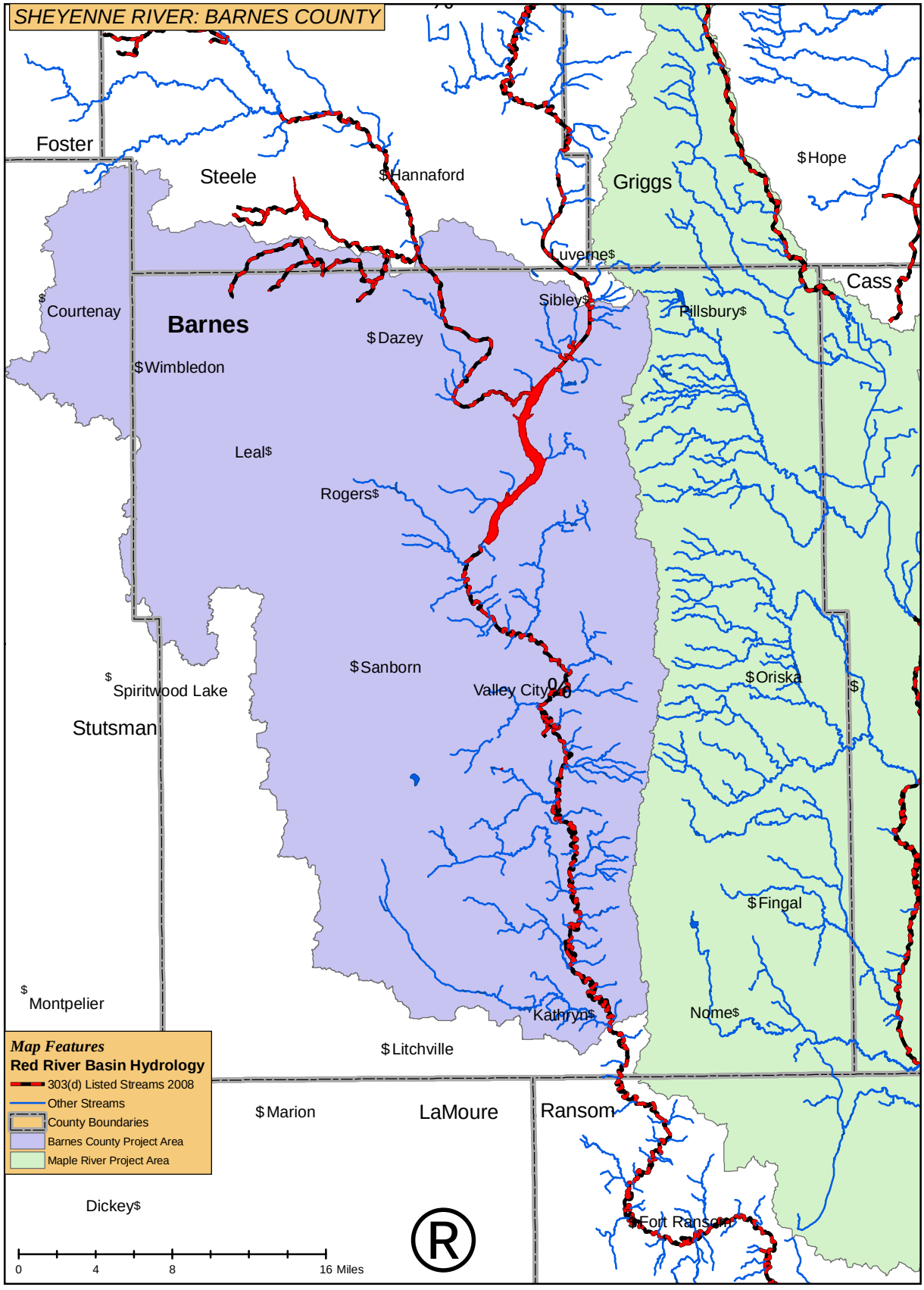

**Graphical Depiction Of 2008 Section 303(d) Listed Waters Needing TMDLs**

* Priority areas will be along a ½ mile corridor of the Sheyenne, James and Maple Rivers as well as their tributaries.

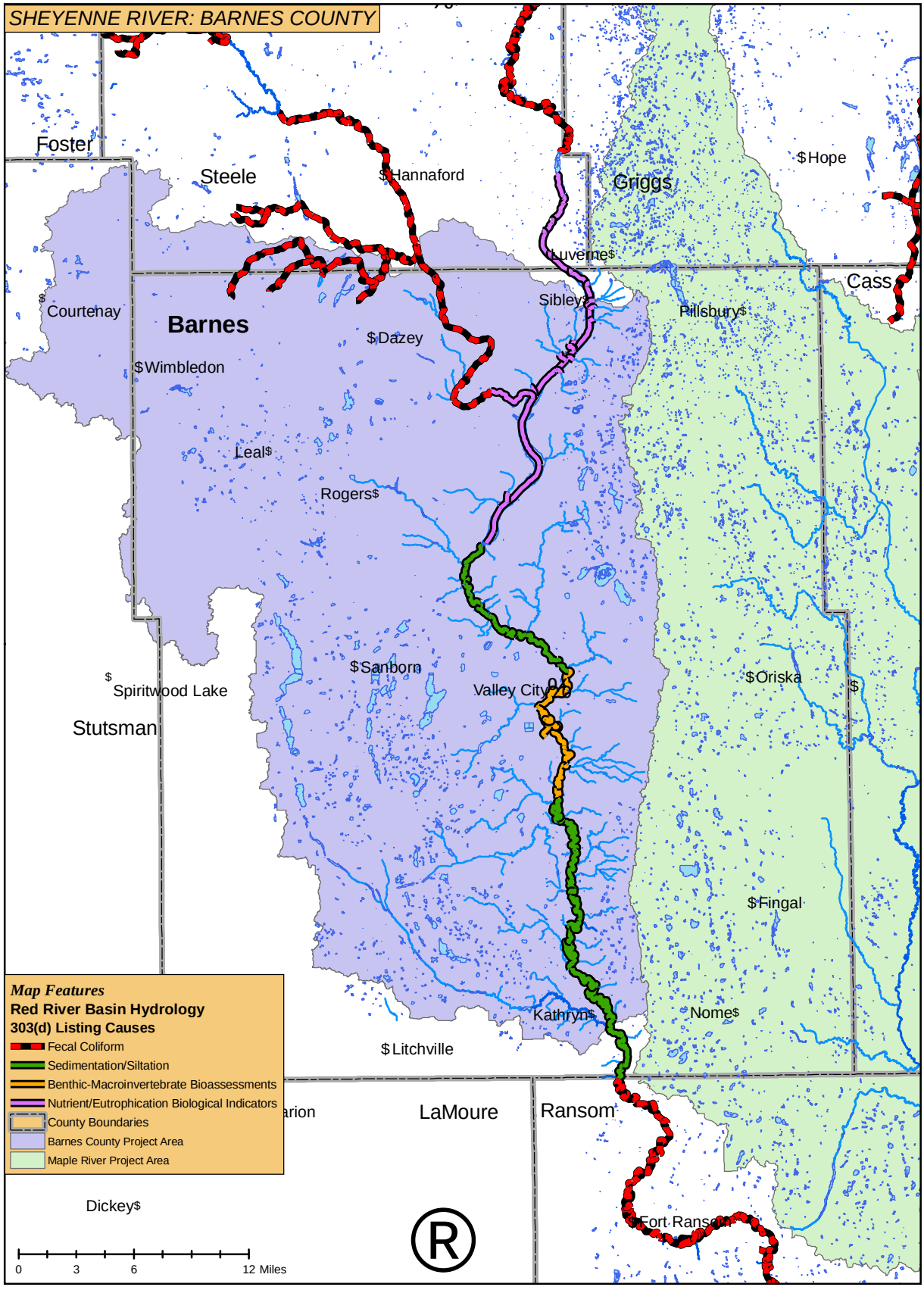
# Sheyenne River Water Quality Sampling Location



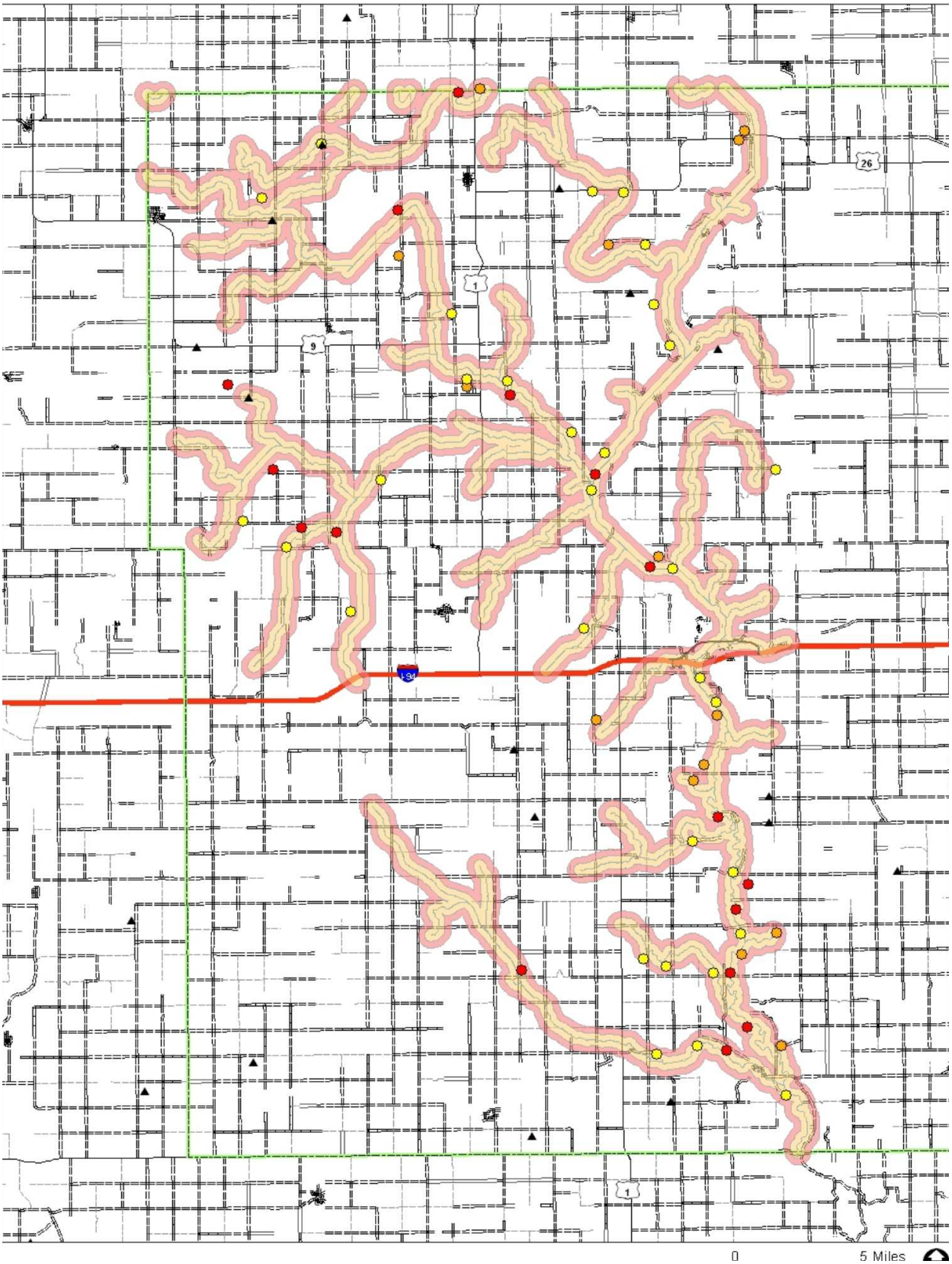
# 303(d) Listed Waters in Barnes County



# Specific 303(d) Listed Impairments in Barnes County



# Potential Animal Feeding Operations Along the Sheyenne River



# APPENDIX #2

# SUMMARY OF
# WATER QUALITY SAMPLING RESULTS FOR
# BARNES COUNTY

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# WATER QUALITY SAMPLING RESULTS FOR
# BARNES COUNTY

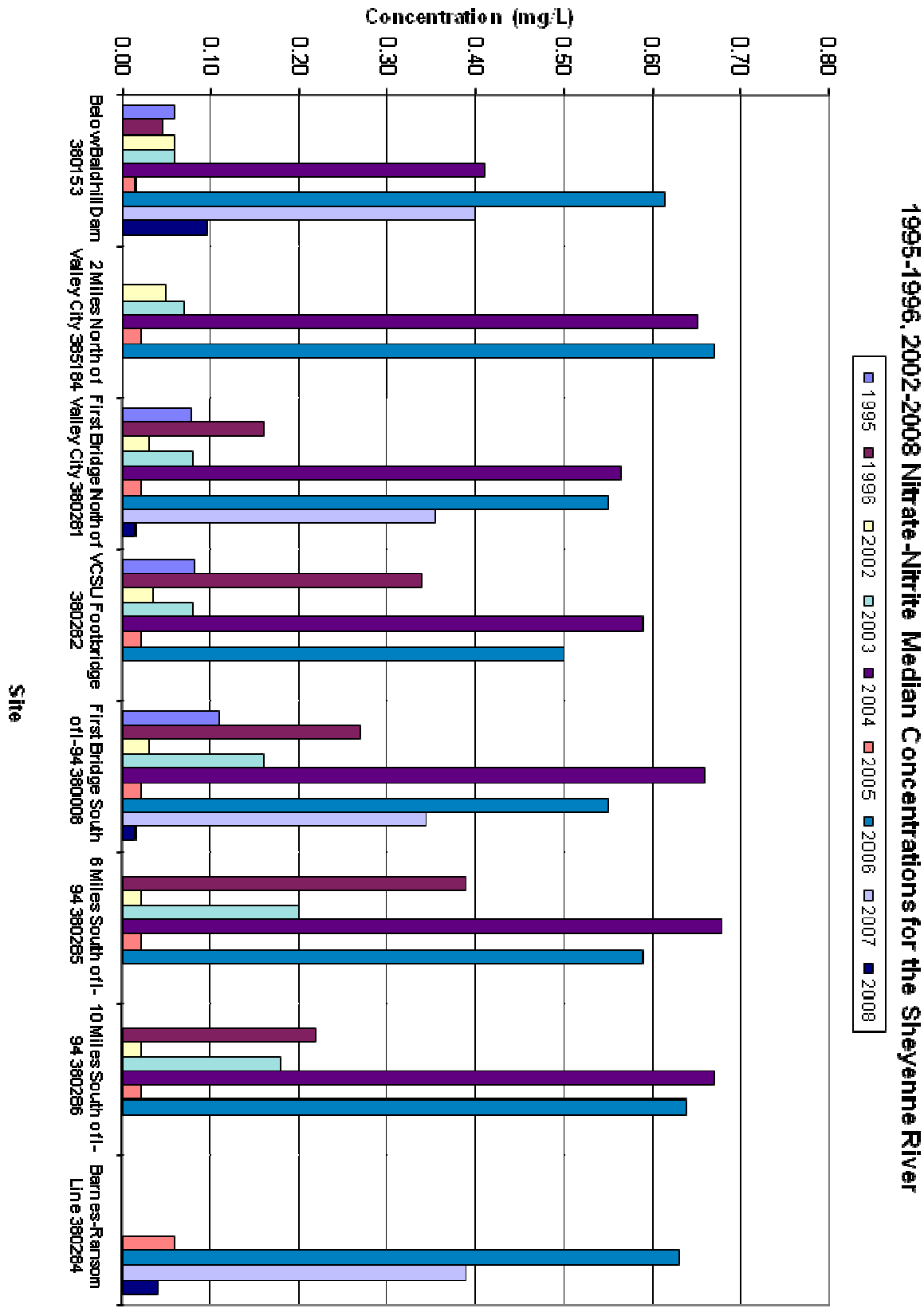
Samples collected for this project were analyzed for total nitrogen (TN), total Kjeldahl nitrogen, nitrate-nitrite, total phosphorus (TP), total suspended solids (TSS), and fecal coliform bacteria (FCB).

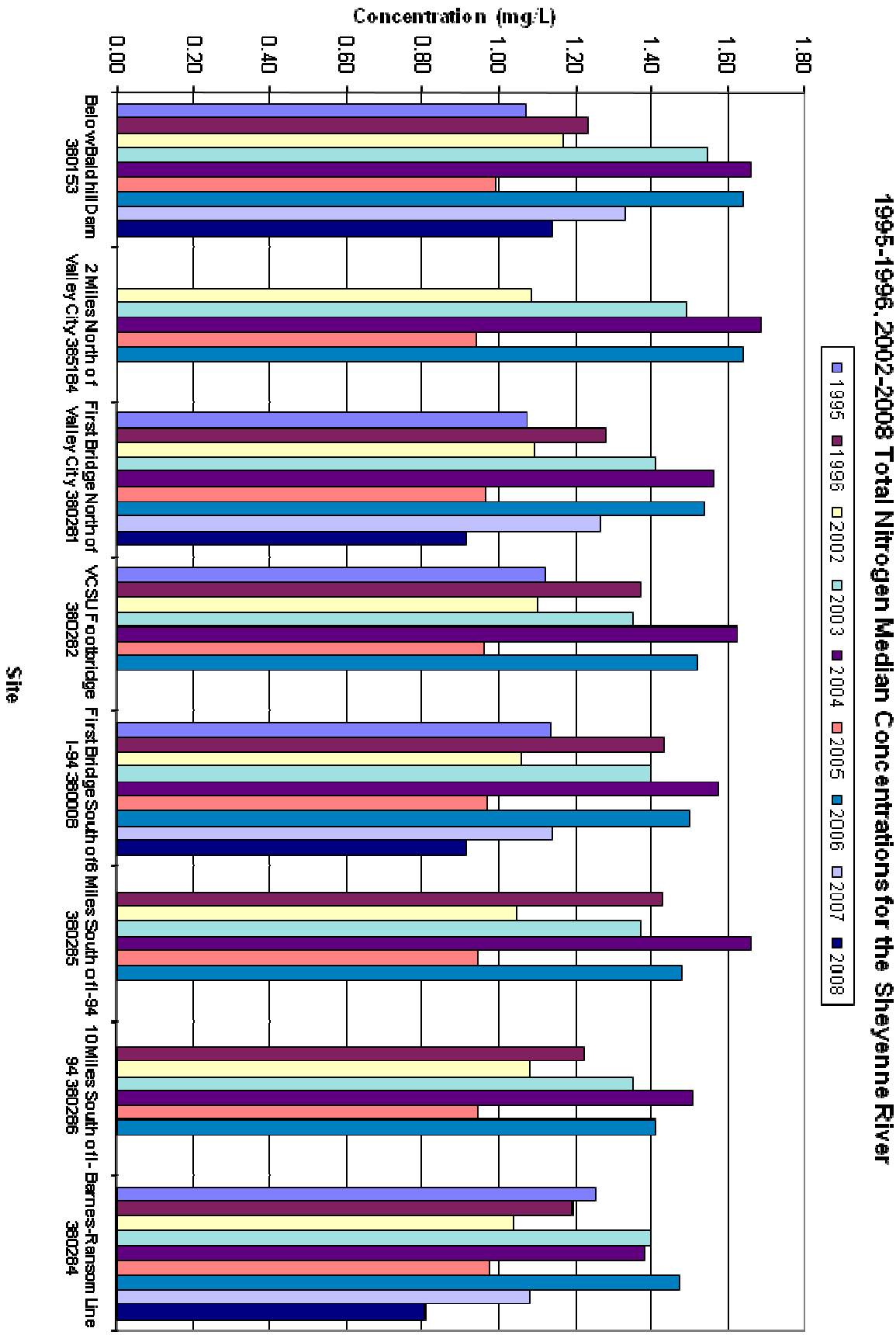
Primary pollutants which may be causing the aquatic life use impairments include suspended solids, nutrients, and organic material. Pathogens, as indicated by FCB, are the primary causes of recreation use impairment. The following water quality summaries are based on data collected from 2002 to 2008.

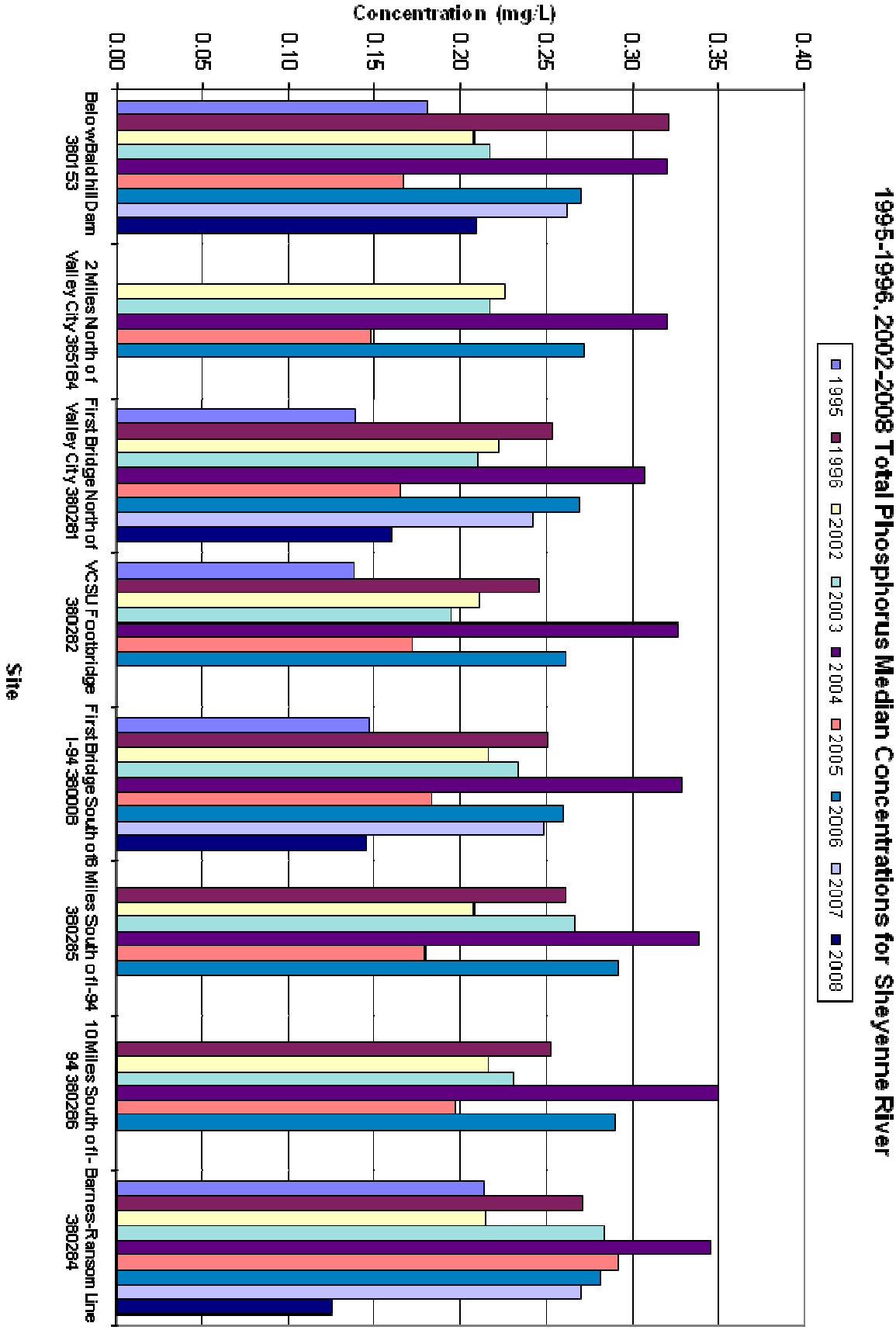
Median nitrate-nitrite concentrations (page 18) have a yearly tendency to decrease from March through September. Levels at all sites were approximately two to four times the NDDoH's recommended level of 0.25 mg/l for at least 2 years in the project lifespan. Generally, TN should be in the range of 1.0 mg/L to 1.5 mg/L, TP should be below 0.100 mg/L. Inter-year median concentrations of TN generally fall into the range of acceptability (page 19). However, The NDDoH's concentration guideline of 0.1 mg/l for TP in riverine systems was exceeded at all sites from 2002 to 2008. All sites had yearly median TP concentrations two to three times the state guidelines (page 20). Intra-year sample comparison shows that spring concentrations of TP and TN are commonly higher the further upstream samples are collected but eventually instream concentrations lower and level off towards midsummer (page 24-25). When inter-year median concentrations of nitrate-nitrite, TN, and TP are studied, all sites show related shifts in levels (higher or lower) which suggests something other than surface run-off or internal cycling of the river is controlling concentrations (i.e. inflow to Lake Ashtabula, internal cycling, and release from the Baldhill Dam).

As water leaves Baldhill Dam, TSS levels have historically been very small. As water travels further downstream TSS values rise sharply with yearly median concentrations increasing sharply to the last sight of sample collection at the Barnes/Ransom County line (page 21). Samples taken in the spring tend to have high concentrations but by midsummer levels drop and remain stable throughout the remained of summer and into fall.

The defined criteria for the geometric mean of FCB and percent of samples greater than 400 CFU/100mL that determine if there are any recreational use impairments and are set at 200 CFU/ 100mL and 10 percent, respectively. All sites have low geometric means which reveals that the watershed does not have chronically high FCB concentrations (page 22). However, samples collected after rainfall events show an acute problem with surface runoff exists as 6 of 8 sites had at least one year where 10% of samples taken at the site exceeded the state standard of 400 CFU per 100 ml of sampled filtered (page 23). Therefore 6 of the 8 sites have threatened recreational uses.


1995-1996, 2002-2008 Nitrate-Nitrite Median Concentrations for the Sheyenne River
Concentration (mg/L)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
1995
1996
2002
2003
2004
2005
2006
2007
2008
Site
Below Baldhill Dam 380153
2 Miles North of Valley City 385184
First Bridge North of Valley City 380281
VCSU Footbridge 380282
First Bridge South of I-94 380008
6 Miles South of I-94 380285
10 Miles South of I-94 380286
Barnes-Ransom Line 380284


1995-1996, 2002-2008 Total Nitrogen Median Concentrations for the Sheyenne River
Concentration (mg/L)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
1995
1996
2002
2003
2004
2005
2006
2007
2008
Site
Below Baldhill Dam 380153
2 Miles North of Valley City 365184
First Bridge North of Valley City 380281
WCSU Footbridge 380282
First Bridge South of I-94 380008
6 Miles South of I-94 380285
10 Miles South of I-94 380286
Barnes-Ransom Line 380284


1995-1996, 2002-2008 Total Phosphorus Median Concentrations for Sheyenne River
Concentration (mg/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
1995
1996
2002
2003
2004
2005
2006
2007
2008
Site
Below Baldhill Dam 380153
2 Miles North of Valley City 365184
First Bridge North of Valley City 380261
VCSU Footbridge 380262
First Bridge South of I-94 380008
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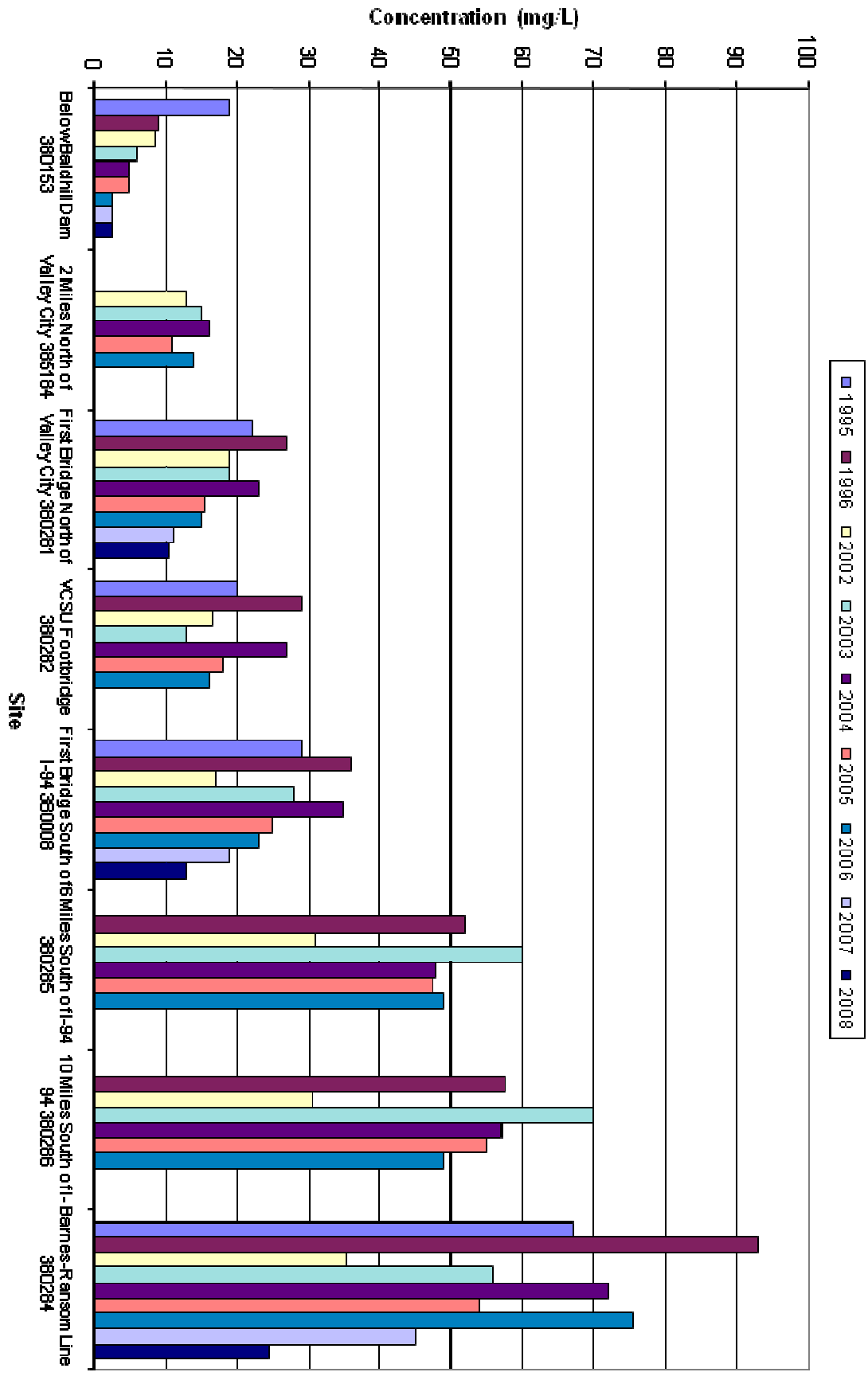
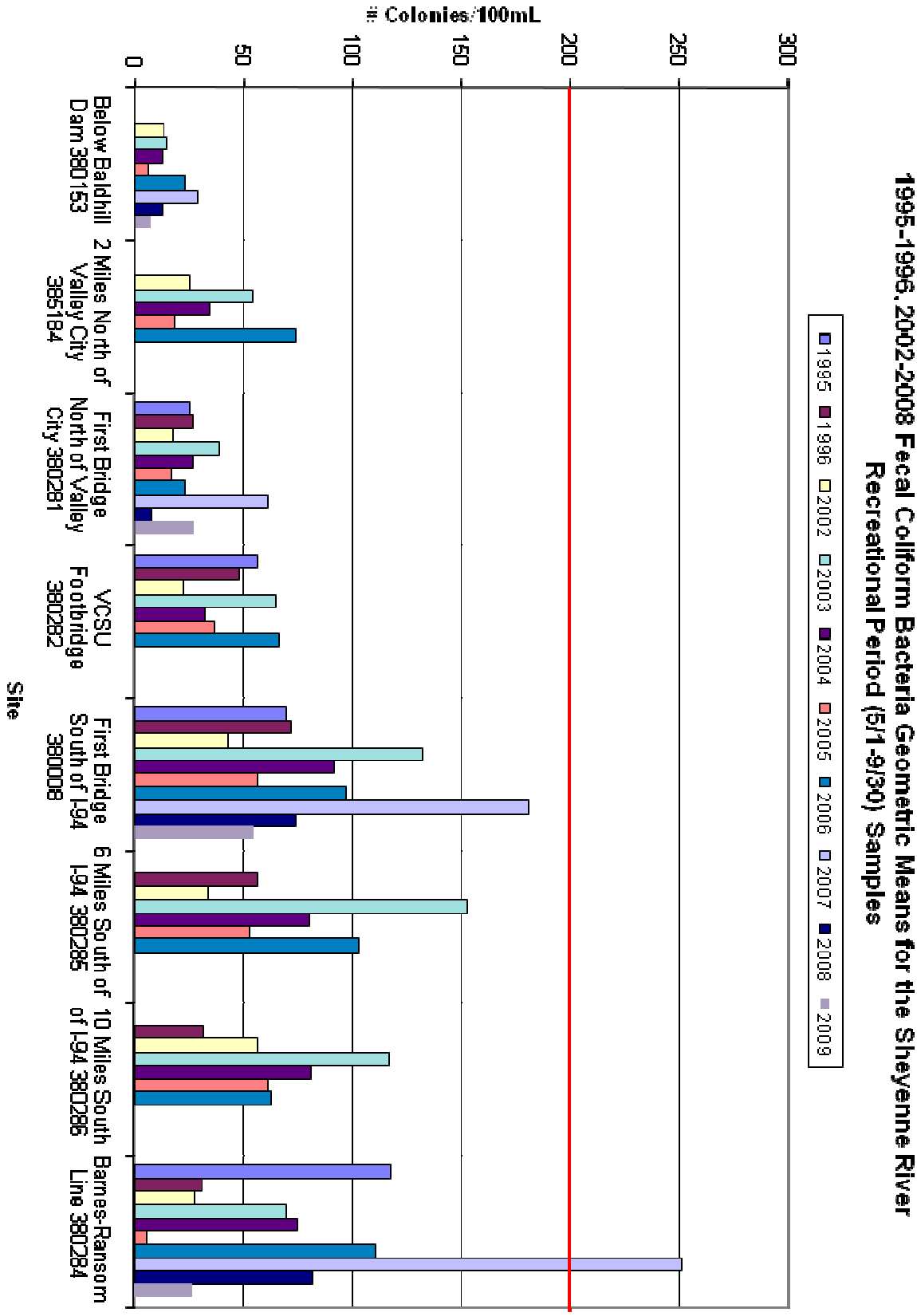
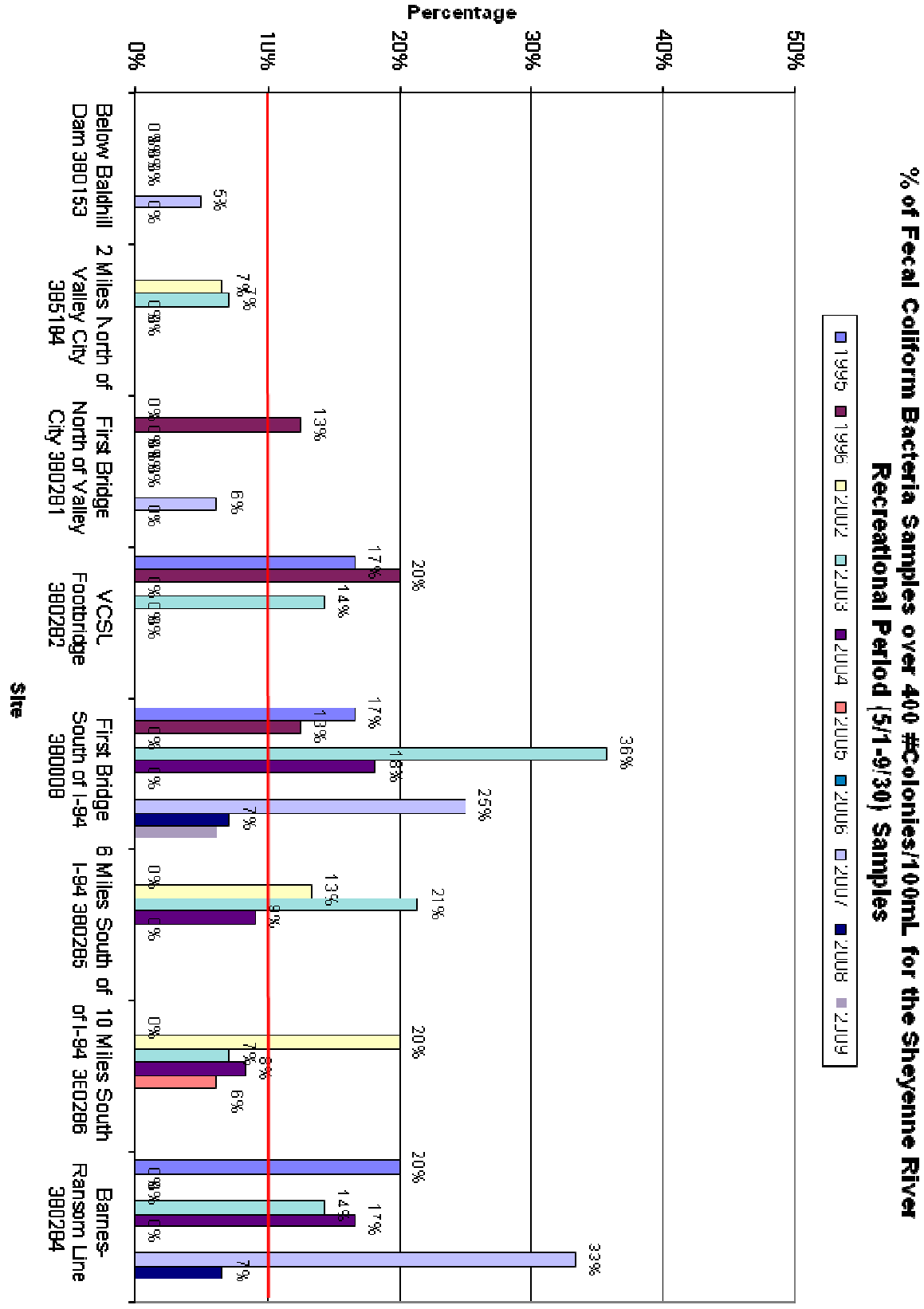
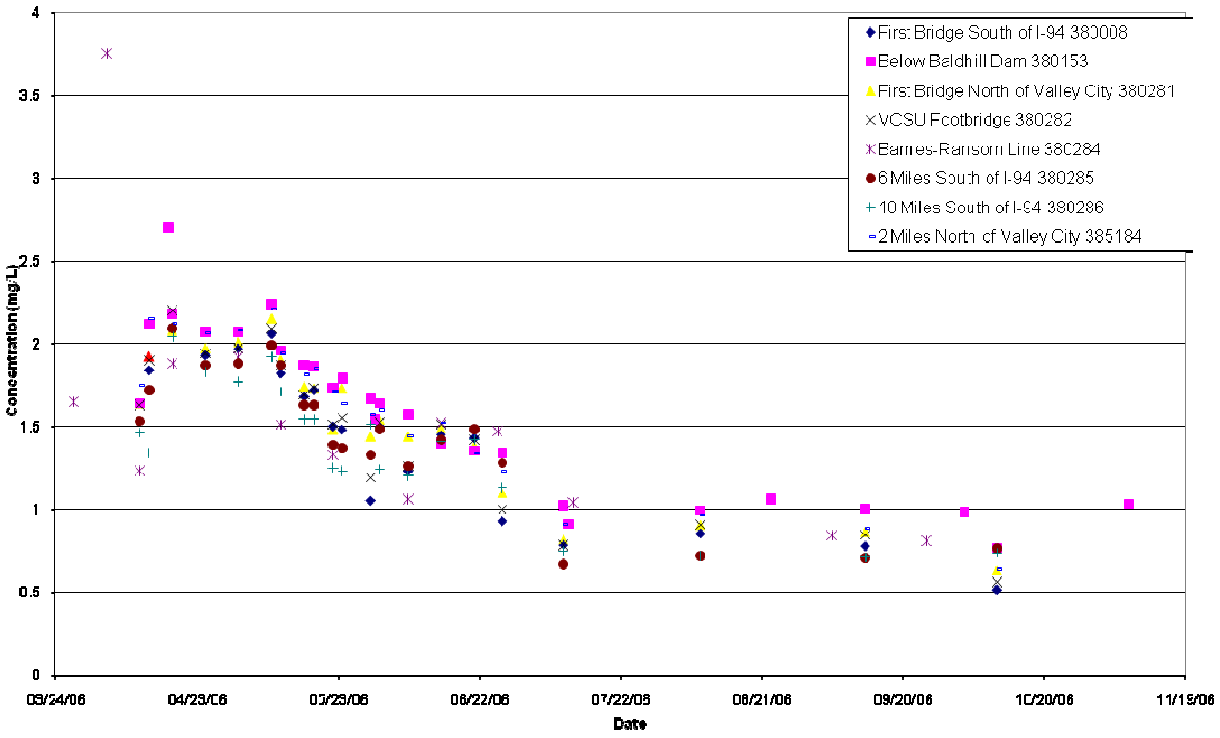

1995-1996, 2002-2008 Total Suspended Solids Median Concentrations for Sheyenne River
Concentration (mg/L)
0
10
20
30
40
50
60
70
80
90
100
1995
1996
2002
2003
2004
2005
2006
2007
2008
Site
Below Baldhill Dam 380153
2 Miles North of Valley City 380184
First Bridge North of Valley City 380261
YCSU Footbridge 380282
First Bridge South of I-94 380008
6 Miles South of I-94 380265
10 Miles South of I-94 380286
Barnes-Ransom Line 380284

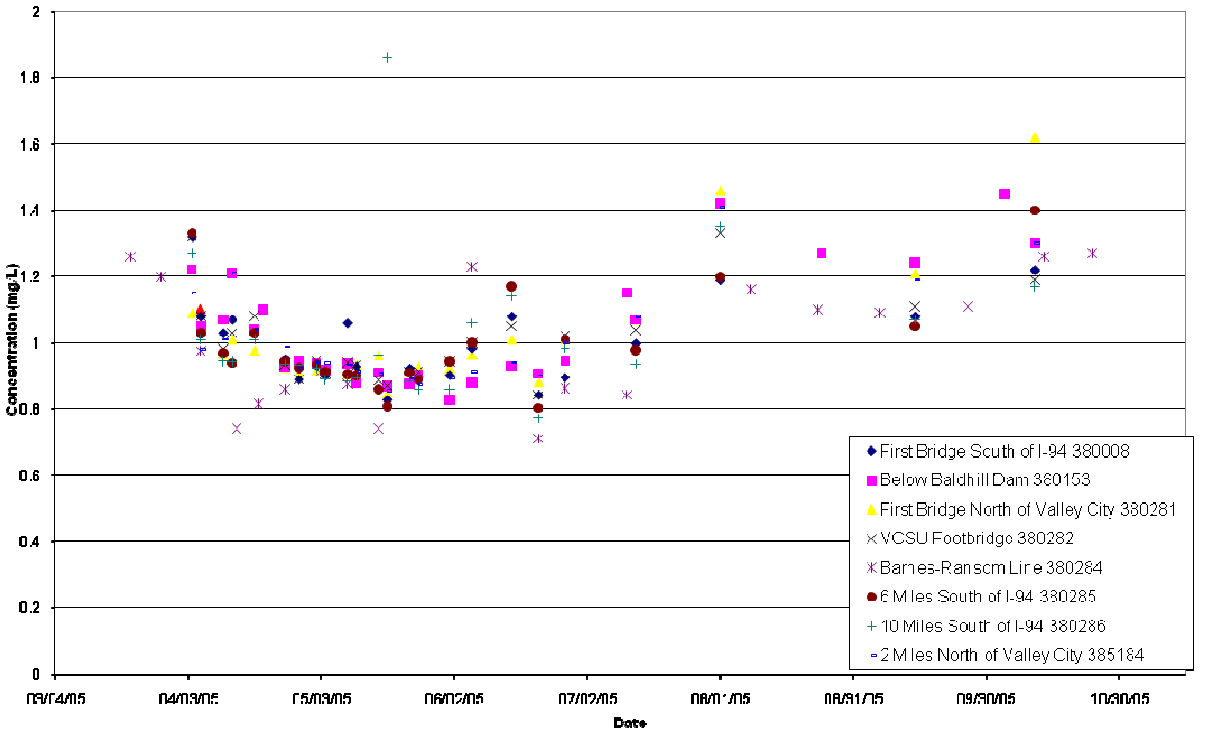

1995-1996, 2002-2008 Fecal Coliform Bacteria Geometric Means for the Sheyenne River
Recreational Period (5/1-9/30) Samples
# Colonies/100mL
0
50
100
150
200
250
300
1995
1996
2002
2003
2004
2005
2006
2007
2008
2009
Below Baldhill Dam 380153
2 Miles North of Valley City 385184
First Bridge North of Valley City 380281
VCSU Footbridge 380282
First Bridge South of I-94 380008
6 Miles South of I-94 380285
10 Miles South of I-94 380286
Barnes-Ransom Line 380284
Site


% of Fecal Coliform Bacteria Samples over 400 #Colonies/100mL for the Sheyenne River
Recreational Period (5/1-9/30) Samples
1995
1996
2002
2003
2004
2005
2006
2007
2008
2009
Percentage
0%
10%
20%
30%
40%
50%
Site
Below Baldhill Dam 380153
2 Miles North of Valley City 385194
First Bridge North of Valley City 380281
VCSU Footbridge 380282
First Bridge South of I-94 380009
6 Miles South of I-94 380285
10 Miles South of I-94 3E0286
Barnes-Ransom Line 380284

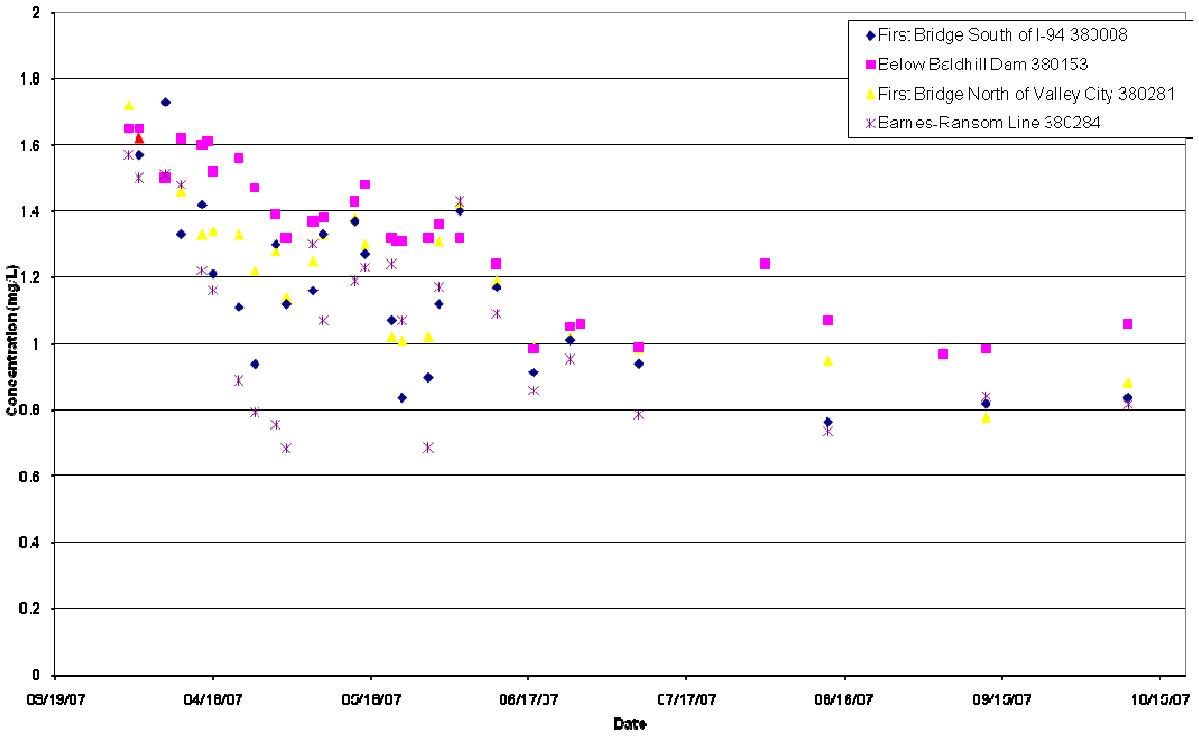
**Total Nitrogen 2006**



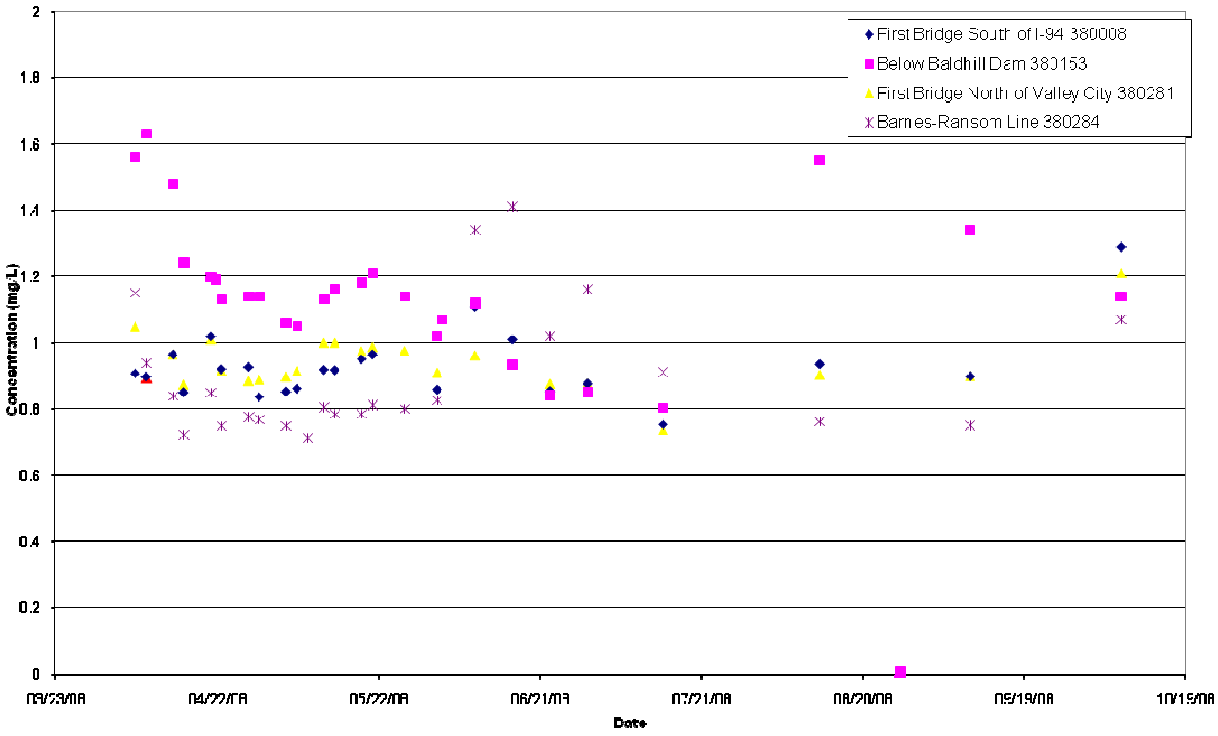

**Total Nitrogen 2005**



**Total Nitrogen 2007**




**Total Nitrogen 2008**



# APPENDIX #3

# LETTERS OF SUPPORT

Representative Ralph Metcalf
District 24
11819 33rd Street SE
Valley City, ND 58072-9404

# NORTH DAKOTA HOUSE OF REPRESENTATIVES

STATE CAPITOL
600 EAST BOULEVARD
BISMARCK, ND 58505-0360

COMMITTEES:
Human Services
Government and
Veterans Affairs

October 23, 2009

Lori Frank, Watershed Coordinator
Barnes County Soil Conservation District
570 10th St SW, Suite 3
Valley City, ND 58072

Dear Ms. Frank,

Sometimes I find that the best way of recognizing accomplishments is to stop and look back to where we started and then look at where we are today.

We started with a humble beginning, utilizing men and women with vision to develop plans that would carry water quality best management practices in a direction that would start the process of bringing water quality to the forefront of protection for our citizens. As you know, this has not been an easy task but it has been rewarding. Several practices of ag-waste systems are in place and serve as examples of what should, and can be done to maintain water systems for our future.

There is no doubt in my mind that safe, quality water is essential to the future of this country. TV documentaries of what other regions of this world are fighting to achieve just to maintain life should act as a warning of what could happen if we don't continue to improve our agriculture systems to insure quality water. We could find ourselves in the same position as these other countries if we fail to move forward and allow ourselves to fall behind in our preparation of systems that will guarantee safe and adequate water far into the future.

We cannot allow ourselves to stop the development of this important need. Money is the essential commodity to insure quality water into the future and providing safe water for future generations should be our priority. We must change our thought process. Water must become the first priority as the access to quality water will determine our future. Your children will thank you.

Sincerely,

Ralph Metcalf

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

Barnes County SCD
575 10th Street SW – Suite 3
Valley City, ND 58072

October 16, 2009

Dear Ms. Frank:

The North Dakota Game & Fish Department fully supports your efforts and grant proposal in improving the water quality of Barnes County and especially the lake and reservoir systems that support fisheries. The Barnes County SCD and your efforts in putting projects on the ground not only improve water quality but ultimately the fishery of our states water bodies. If at any time during your project period you would like assistance with your efforts please do not hesitate to contact me. The North Dakota Game and Fish Dept., specifically the Save Our Lakes Program is always looking to improve our states water quality and partnerships are an important part of that process. Good Luck!

Best Regards,

Scott A. Elstad
Aquatic Habitat Supervisor
North Dakota Game & Fish Department
100 North Bismarck Expressway
Bismarck, North Dakota 58501-5095

**United States Department of Agriculture**

NRCS
Natural Resources Conservation Service
575 10TH ST SW, Ste 3
Valley City, ND 58072

October 8, 2009

Mrs. Shelly Nelson Chairperson
Barnes County Soil Conservation District
575 10TH ST SW
Valley City, ND 58072-3906

Dear Mrs. Nelson:

The Natural Resources Conservation Service (NRCS) supports the goals and objectives of your proposed EPA-319 Barnes County Project. The Barnes County Soil Conservation District's continued efforts in resource conservation are commendable. We strongly support the continuation and expansion of the project.

As with any request for NRCS assistance, our assistance is based on availability of staff and budget. A detailed request for NRCS technical, educational, and financial assistance should be submitted to the local district conservationist. This request will then be forwarded to the appropriate assistant state conservationist for their review and approval.

We look forward to assisting you the implementation of this water quality implementation project.

Sincerely,

Brent Gustafson
District Conservationist

Barnes Rural Water District
421 W Main St, Valley City, ND 58072 • 701-845-1117 or Toll Free 877-845-1117

October 9, 2009

To Whom It May Concern:

Barnes Rural Water District is in full support of water conservation, water quality management and any ground water protection practices in general.

Barnes Rural Water does participate in a Wellhead Protection Program and knows the importance of good quality management practices.

Sincerely,

Perry Kapaun
Manager
Barnes Rural Water District

**BARNES COUNTY**
**SOIL CONSERVATION DISTRICT**
575 10th Street SW – Suite 3
Valley City, ND 58072
Phone: 701-845-3114, Ext. # 3 - Fax: 701-845-5605

October 19, 2009

Lori Frank, Coordinator
Barnes County Sheyenne Watershed Project
575 10th St SW
Valley City, ND 58072

Dear Ms Frank:

As coordinator for the North Dakota Statewide Eco-Ed Project, I see a great need for a project such as the Barnes County Sheyenne Watershed Project.

The main purpose of my project (ND Eco-Ed) is to educate our students and their parents as to the need to improve water quality in all watersheds in North Dakota. The BC Sheyenne Watershed Project puts into practice exactly what we are teaching our students and their parents to do. Through the watershed project, we have actual examples of BMPs and data to prove their effectiveness.

It is my opinion that too many conservation groups and agencies do a lot of talking and not much implementation. The BC Sheyenne Watershed Project provides funds to actually put BMPs into practice. The Barnes County Soil Conservation District Board of Supervisors has given approval for me to assist the watershed project anytime it is necessary.

We need projects such as this one if we are to continue to improve water quality in the North Dakota watersheds.

Sincerely,

Karen Olstad

KAREN OLSTAD, Coordinator
North Dakota Statewide Eco-Ed Project

Our 11th commandment: Thou shalt safeguard thy fields from erosion, thy living waters from drying up, thy forest from desolation.....that thy descendents may have abundance forever.

**K$_2$S ENGINEERING INC.**
4209 94TH AVE SE
YPSILANTI, NORTH DAKOTA 58497
PHONE: (701) 489-3322
CELL: (701) 320-6493
EMAIL: K2S@DAKTEL.COM

October 15, 2009

Shelly Nelson
Board Chairperson
Barnes County SCD
575 10th Street SW Suite 3
Valley City, ND 58072

**Re: Letter of Support**

Dear Shelly,

I have worked with the Barnes County Soil Conservation District for 11 years; 5 as the Lead Engineer on the BMP team with the Sheyenne James RC&D, and 6 years as the President of K2S Engineering, providing engineering services and technical support for the practices being designed and installed for the Sheyenne River Water Shed Project in this area. This program is important for implementing practices to improve water quality and educating the community about the importance of maintaining water quality.

We strongly support the continuation and growth of such a significant program as protecting and managing the Sheyenne River Watershed.

Thank-you,

Shane Kjellberg, PE

# APPENDIX #4

# MILESTONE TABLE

MILESTONE TABLE FOR BARNES COUNTY SHEYENNE WATERSHED PROJECT

| Tasks/Responsible Organizations | Output | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| **Objective 1:** | | | | | | |
| Task 1: Barnes Co. SCD | 4 Full Containment Systems | ** | ** | ** | ** | ** |
| Task 2: Barnes Co SCD | 8 Partial Containment Systems | ** | ** | ** | ** | ** |
| Task 3: Barnes Co SCD | 10 Miles of Protected Streambank | ** | ** | ** | ** | ** |
| Task 4: Barnes Co SCD | Septic System Inventory | ** | | | | |
| Task 5: Barnes Co SCD | 10 Septic systems | ** | ** | ** | ** | ** |
| **Objective 2:** | | | | | | |
| Task 6: Barnes Co SCD | 2 Full & 4 Partial containment systems | ** | ** | ** | ** | ** |
| Task 7: Barnes Co SCD | 5 Miles of Protected Streambank | ** | ** | ** | ** | ** |
| **Objective 3:** | | | | | | |
| Task 8: Barnes Co SCD | Tours, workshops, website, etc | ** | ** | ** | ** | ** |
| Task 9: Barnes Co SCD | Research data | ** | ** | ** | ** | ** |

Barnes County SCD as local project manager and sponsor will be responsible for project coordination of reimbursement payments, tracking and progress. The SCD will also provide technical assistance for planning, design and implementation.

Landowners will make management decisions and provide cash and in-kind match for BMP's.

NDDH will provide oversight of planning and expenditures.

# APPENDIX #5

# BUDGET

BUDGET TABLE FOR BARNES COUNTY SHEYENNE WATERSHED PROJECT

| PART 1:<br>FUNDING SOURCES | 2010 | 2011 | 2012 | 2013 | 2014 | TOTALS |
|---|---|---|---|---|---|---|
| **EPA SECTION 319 FUNDS** | | | | | | |
| 1) FY2010 - 2014 (FA) | $169,740 | $169,740 | $169,740 | $169,740 | $169,740 | $848,700 |
| SUBTOTAL | **$169,740** | **$169,740** | **$169,740** | **$169,740** | **$169,740** | **$848,700** |
| **OTHER FEDERAL FUNDS** | | | | | | |
| 1) RC&D (TA & FA) | $5,000 | $5,000 | $5,000 | $5,000 | $5,000 | $25,000 |
| 2) NRCS (TA) | $2,000 | $2,000 | $2,000 | $2,000 | $2,000 | $10,000 |
| 2) NDDH (TA) | $2,000 | $2,000 | $2,000 | $2,000 | $2,000 | $10,000 |
| SUBTOTAL | **$9,000** | **$9,000** | **$9,000** | **$9,000** | **$9,000** | **$45,000** |
| **STATE/ LOCAL MATCH** | | | | | | |
| 1) LOCAL SCD (TA & FA) | $21,000 | $21,000 | $21,000 | $21,000 | $20,800 | $104,800 |
| 2) LANDOWNERS (FA) | $73,200 | $87,600 | $135,600 | $84,400 | $75,200 | $456,000 |
| 3) NDSU EXTENSION SERVICE (TA) | $500 | $500 | $500 | $500 | $500 | $2,500 |
| 4) BARNES COUNTY RWU (FA) | $500 | $500 | $500 | $500 | $500 | $2,500 |
| SUBTOTAL | **$95,200** | **$109,600** | **$157,600** | **$106,400** | **$97,000** | **$565,800** |
| **TOTAL BUDGET** | **$273,940** | **$288,340** | **$336,340** | **$285,140** | **$275,740** | **$1,459,500** |

FA: Financial Assistance
TA: Technical Assistance
RC&D: Resource Conservation & Development
NRCS: Natural Resources Conservation Service
NDDH: North Dakota State Health Department
SCD: Soil Conservation District
NDSU: North Dakota State University
RWU: Rural Water Users

BUDGET TABLE FOR BARNES COUNTY SHEYENNE WATERSHED PROJECT
PART 2: SECTION 319/ NON-FEDERAL

| | 2010 | 2011 | 2012 | 2013 | 2014 | TOTAL COSTS | CASH* MATCH | INKIND MATCH | 319 FUNDS |
|---|---|---|---|---|---|---|---|---|---|
| **PERSONNEL/SUPPORT** | | | | | | | | | |
| 1) Salary/ Fringe | $45,500 | $47,000 | $48,500 | $50,000 | $51,500 | $242,500 | $25,000 | $72,000 | $145,500 |
| 2) Travel, Food & Lodging | $500 | $500 | $500 | $500 | $500 | $2,500 | $250 | $250 | $2,000 |
| 3) Equipment/ Supplies | $100 | $100 | $100 | $100 | $100 | $500 | $100 | $100 | $300 |
| 4) Telephone/ Postage | $600 | $600 | $600 | $600 | $600 | $3,000 | $500 | $0 | $2,500 |
| 5) Training | $500 | $500 | $500 | $500 | $500 | $2,500 | $250 | $250 | $2,000 |
| Subtotals | $47,200 | $48,700 | $50,200 | $51,700 | $53,200 | $251,000 | $26,100 | $72,600 | $152,300 |
| **APPLYING BMP'S** | | | | | | | | | |
| 1) 6 Full Containment Systems | $120,000 | $120,000 | $240,000 | $120,000 | $120,000 | $720,000 | $220,000 | $68,000 | $432,000 |
| 2) 12 Partial Manure Systems | $5,000 | $15,000 | $15,000 | $15,000 | $10,000 | $60,000 | $20,000 | $4,000 | $36,000 |
| 3) Presc Grazing, Buffers, BioEngineering | $50,000 | $60,000 | $60,000 | $60,000 | $50,000 | $280,000 | $80,000 | $32,000 | $168,000 |
| 4) Septic Systems | $8,000 | $24,000 | $24,000 | $16,000 | $8,000 | $80,000 | $32,000 | $0 | $48,000 |
| Subtotals | $183,000 | $219,000 | $339,000 | $211,000 | $188,000 | $1,140,000 | $352,000 | $104,000 | $684,000 |
| **INFORMATION/EDUCATION** | | | | | | | | | |
| 1) Newsletters/Radio | $1,000 | $1,000 | $1,000 | $1,000 | $1,000 | $5,000 | $500 | $500 | $4,000 |
| 2) Tours/Workshops/Public Meetings | $500 | $500 | $500 | $500 | $500 | $2,500 | $250 | $250 | $2,000 |
| 3) Web Site/Displays/School Programs | $600 | $600 | $600 | $600 | $600 | $3,000 | $0 | $0 | $3,000 |
| 4) Discovery Farm | $250 | $0 | $0 | $250 | $0 | $500 | $100 | $0 | $400 |
| Subtotal | $2,350 | $2,100 | $2,100 | $2,350 | $2,100 | $11,000 | $850 | $750 | $9,400 |
| **INVENTORY/MONITORING** | | | | | | | | | |
| 1) Sample Analysis | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| 2) Sample Transport | $800 | $800 | $800 | $800 | $800 | $4,000 | $500 | $500 | $3,000 |
| Subtotals | $800 | $800 | $800 | $800 | $800 | $4,000 | $500 | $500 | $3,000 |
| **ADMINISTRATIVE** | | | | | | | | | |
| 1) Secretary | $1,200 | $1,200 | $1,200 | $1,200 | $1,200 | $6,000 | $0 | $6,000 | $0 |
| 2) SCD Coordination Meetings | $500 | $500 | $500 | $500 | $500 | $2,500 | $0 | $2,500 | $0 |
| Subtotals | $1,700 | $1,700 | $1,700 | $1,700 | $1,700 | $8,500 | $0 | $8,500 | $0 |
| **TOTAL 319/NON-FEDERAL BUDGET** | $235,050 | $272,300 | $393,800 | $267,550 | $245,800 | $1,414,500 | $379,450 | $186,350 | $848,700 |

BMP BUDGET TABLE FOR BARNES COUNTY SHEYENNE WATERSHED PROJECT

| | |
|---|---|
| **MANURE MANAGEMENT SYSTEMS:** | |
| Full Containment- (Site prep, earthwork, solid separators, pipes & culverts, access roads, heavy use areas, fencing, water supply, seeding, etc.) | Engineer's Estimate |
| Partial Systems: (Clean water diversions, dikes, fencing, culverts, etc) | Engineer's Estimate |
| **STREAMBANK PROTECTION:** | |
| Fencing (barbed-wire) | $1.15/ft |
| Fencing (multiple wire electric) | $0.60/ft |
| Field Border (seed costs only) | $20.00/ac |
| Filter Strips (plantin/establishment only) | $125.00/ac |
| Grassed Waterway | $25.00/ft |
| Pasture/Hayland Planting | $35.00/ac |
| Pipelines | $3.00/ft |
| Range Planting | $40.00/ac |
| Spring Development | Engineer's Estimate |
| Stream Channel Stabilization | Engineer's Estimate |
| Streambank & Shoreline Protection | Engineer's Estimate |
| Trough & Tank | $1000/gal |
| Well (livestock) | Local Rate/well |
| Well Decommissioning | Local Rate/well |
| Alternative Power Sources (solar, wind, generator) | Local Rate/system |
| **SEPTIC SYSTEMS:** | |
| Chambers, gravelless, rock & tile systems | $8,000/ea |